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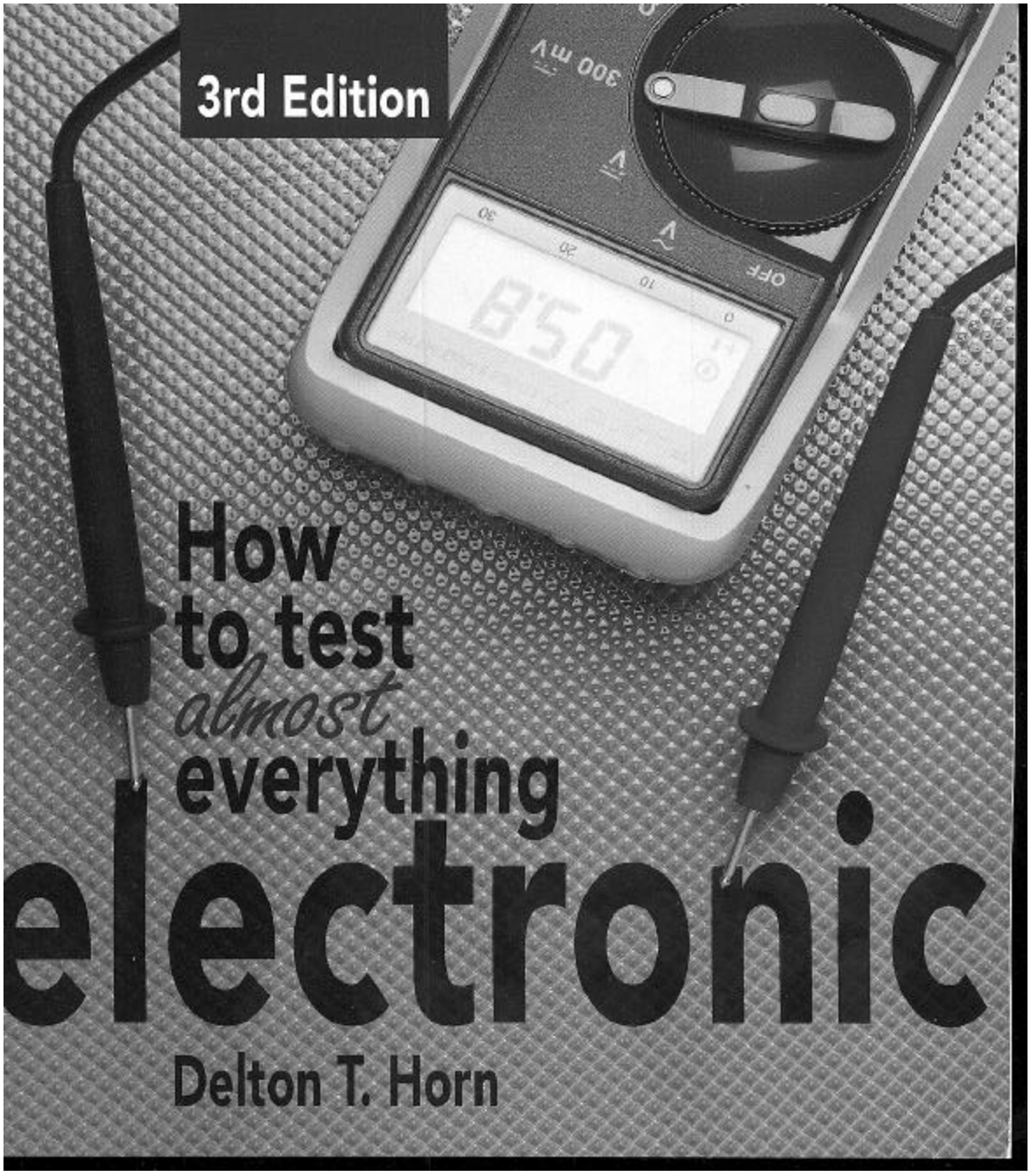

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Introduction

Electronics encompasses those things we can neither hear, see, touch, or taste. Electrical voltage, current, and resistance are invisible to the senses. Of course, you can directly sense an electrical shock, but to learn what's going on within an electronic circuit, you must use test equipment. Test equipment is special apparatus designed to give visible or audible indications of what is there and what it is doing.

Modern test instruments are amazingly versatile. They can do almost anything, if you know how to use them, how they work, and what their limitations are. If you don't know how to use test equipment properly, it is virtually useless. It is also just as important to know what a test instrument can't do. All test instruments can make the tests for which they are designed. Most can make many other tests as well, if you know how the instruments work and how their readings can indicate the presence or absence of other electrical parameters.

That's what this book is about--electronic tests and measurements, how to make them with all types of electronic test equipment, and how to interpret the results. Interpretation is the most important part of the whole process. It requires a full knowledge of both the test equipment and the circuits in which we're taking the readings.

Electronics is a rapidly growing field, with new developments appearing almost daily. Although the basic principles of electronics theory remain the same, often new technology calls for new test procedures. In this new third edition of *How to Test*

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Almost Everything Electronic, every attempt has been made to provide as much up-to-date information as possible. Now-obsolete test procedures involving tube circuits were featured heavily in the original edition. This no-longer-relevant material has been eliminated and replaced with expanded information on testing transistor, and especially IC-based, circuitry.

The most important types of electronic test equipment are introduced in chapter 1. The following two chapters cover a wide variety of voltage and current tests, some of which are less than obvious.

The two most widely used test instruments are the multimeter (VOM, VTVM, or DMM) and the oscilloscope. Basic and advanced test procedures using these powerful test instruments are covered in chapters 4 and 5.

At some point in servicing an electronic circuit, you will need to determine whether or not a specific component has gone bad. Chapter 6 offers many tips on testing various specific types of electronic components.

A number of test procedures for television circuits are given in chapter 7. Chapter 8 features a number of more or less unclassifiable special test procedures, including tests for various types of semiconductors. Chapter 9 covers signal tracing and alignment tests.

Chapter 10, on digital circuits, has been significantly expanded in this edition in response to the growing emphasis on digital circuitry in modern commercial equipment of all types.

Finally, chapter 11 covers the important principles of flow-charting and troubleshooting complex systems comprised of multiple circuits. This information will help you pinpoint the problematic stage, saving a lot of time that could be wasted in making unnecessary tests. Devoting a little time to thinking about the circuit before you turn on your test equipment will never be wasted time. In fact, in the long run, most servicing jobs will go much faster.

As you will discover as you go through this book, there are many shortcuts--combinations of instruments and so forth--that you can use to test almost any electrical quantity, even those that might not appear to be within the range of your test equipment. A surprising number of electronic tests can be made with little more than a pilot lamp, a neon lamp, or a dc voltmeter. However, other tests require more sophisticated, and expensive, equipment.

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Although it is obviously impossible for any single volume to cover every possible type of electronic test procedure, our goal has been to offer as wide a range of generally applicable procedures as possible. In updating the material for this book, we have tried to live up to the title as much as possible and help the reader learn "how to test almost everything electronic."

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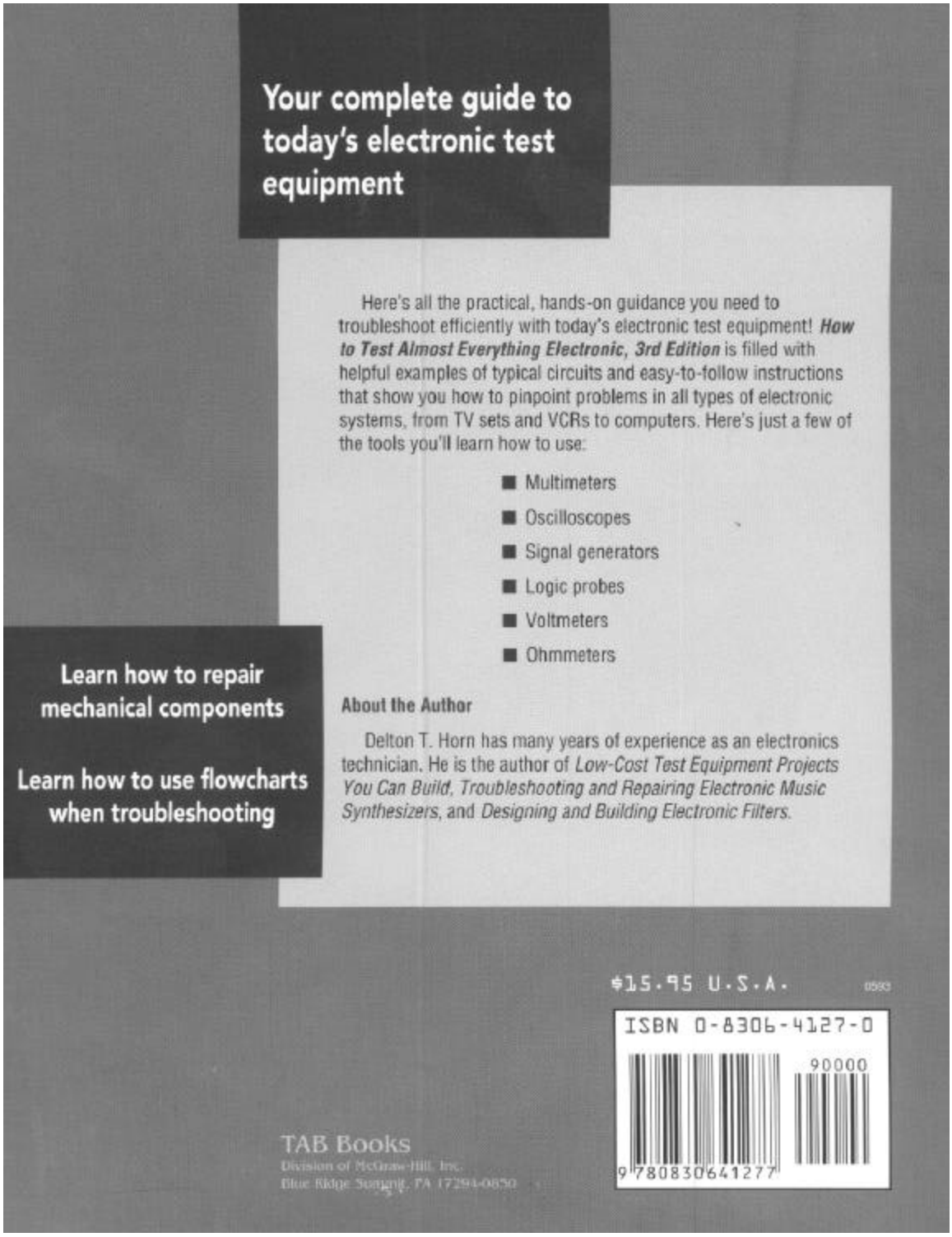
Your complete guide to today's electronic test equipment
Here's all the practical, hands-on guidance you need to troubleshoot efficiently with today's electronic test equipment! How to Test Almost Everything Electronic, 3rd Edition is filled with helpful examples of typical circuits and easy-to-follow instructions that show you how to pinpoint problems in all types of electronic systems, from TV sets and VCRs to computers. Here's just a few of the tools you'll learn how to use:
Multimeters
Oscilloscopes
Signal generators
Logic probes
Voltmeters
Ohmmeters
Learn how to repair mechanical components
Learn how to use flowcharts when troubleshooting
About the Author
Delton T. Horn has many years of experience as an electronics technician. He is the author of Low-Cost Test Equipment Projects You Can Build, Troubleshooting and Repairing Electronic Music Synthesizers, and Designing and Building Electronic Filters.
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